

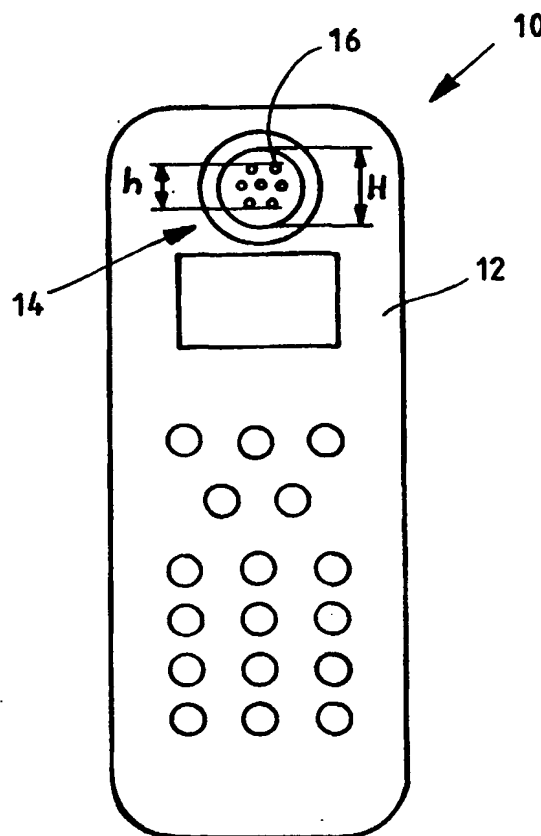


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/FI97/00825 <b>(22) International Filing Date:</b> 19 December 1997 (19.12.97)  <b>(30) Priority Data:</b> 965120 19 December 1996 (19.12.96) FI  <b>(71)(72) Applicant and Inventor:</b> LEHTINEN, Markku [FI/FI]; Länkkikatu 4 A 1, FIN-20780 Kaarina (FI).  <b>(74) Agent:</b> TURUN PATENTTITOIMISTO OY; P.O. Box 99, FIN-20521 Turku (FI).		<b>(81) Designated States:</b> JP, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> <i>In English translation (filed in Finnish).</i>

**(54) Title:** ATTACHMENT SYSTEM FOR A MOBILE PHONE OR THE LIKE**(57) Abstract**

An attachment system for a mobile phone or the like portable communication means for temporarily attaching it to a belt or the like supporting surface. The system comprises an attachment member (14) fastened to the casing (12) of the portable communication means, and a holder to which said attachment member can be locked. The attachment member (14) comprises according to the invention a member forming a rim and is fastened to the casing (12) in the way that it surrounds the openings of the loudspeaker arranged there.



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## ATTACHMENT SYSTEM FOR A MOBILE PHONE OR THE LIKE

The present invention relates to an attachment system according to the preamble of claim 1 for a mobile phone or  
5 the like portable communication means for temporarily attaching it to a belt, the dashboard of a car or the like supporting surface. The attachment system comprises an attachment member fastened to the casing of the portable communication means, and a holder on the supporting surface  
10 to which said attachment member can be locked.

Portable telephones are nowadays used to an ever increasing extent in the noise of the traffic and other noisy places where the audibility often constitutes a problem. The loud  
15 speaker of the mobile phone is usually visible as small openings in the casing of the phone. The sound coming from those openings gets easily lost in the noise of the surroundings. It is however not desirable to add earphones to the telephone, as this should be kept as light and small  
20 as possible. The mobile phone and its casing should be made as "streamlined" as possible without any unnecessary members protruding from the casing.

It is an object of the present invention to provide a  
25 remedy for the above described problem. It is a particular object of the invention to provide an attachment system which can be utilized to improve the audibility of a mobile phone.

30 In order to achieve the above object the attachment system according to the invention is mainly characterized by the features defined in the characterizing part of claim 1.

A preferred embodiment of the attachment system according  
35 to the invention comprises a member substantially forming a rim and fastened to the casing of the communication means at the location of the loud speaker arranged there in the way that it surrounds the openings of the loud speaker.

The attachment member is thus integrated into the casing of the phone or a corresponding communication means at the place where the loud speaker is located and is thus placed  
5 against the ear when the phone is used. There is an opening, or several openings, in the casing of the phone at the location of the loud speaker through which the sound passes from the loud speaker towards the ear. The attachment member disposed at the location of the openings  
10 thus forms an earphone on the loud speaker. The earphone leads the sound to the ear and at the same time prevents noise from reaching the ear. The attachment member can be positioned in the ear cavity and the sound can thus be directed into the ear better than earlier, at the same time  
15 dampening disturbing noise from the environment or preventing it from reaching the ear.

A number of arrangements of various designs are possible. It is in many prior attachment systems possible to dispose  
20 the attachment member at the loud speaker and arrange the structural parts of the attachment member in form of a rim so that an opening of the same size as the area formed by the loudspeaker openings is formed inside the rim for leading the sound to the ear. The attachment members  
25 arranged in form of a rim prevent the noise from reaching the ear. An opening can, on the other hand, easily be arranged in the middle of the attachment member in some attachment systems. The modifications required can often be made without the attaching capacity of the attachment  
30 member being changed.

Typically the member forming the rim comprises  
- a cylindrical part, the first end of which is fastened to the casing of the communication means and the inner  
35 diameter of which is larger than the diameter of the area provided with openings formed by the openings of the loud speaker on the surface of the casing, and

- an actual annular locking member formed at the rim of the second end of the cylindrical part, by means of which the attaching member can be locked to the holder.

5 The inner diameter of the annular locking member is substantially of the same size as the inner diameter of the cylindrical part, and the outer diameter is larger than the outer diameter of the cylindrical part. The annular locking member preferably forms a mainly convex surface against the  
10 ear, whereby it feels pleasant when it is held against the ear.

In an other preferred embodiment of the invention the member forming a rim comprises a part shaped as a truncated  
15 cone

- having an axial centre hole, the inner diameter of which is larger than the diameter of the area provided with openings formed by the openings of the loud speaker on the surface of the casing, and  
20 - which is fastened to the casing of the communication means at its narrow end.

The attachment member is typically fastened to the phone on its front side. If the loud speaker openings are situated  
25 on the back side of the phone, the attachment is of course fastened on this side.

The invention will now be described more in detail with reference to the accompanying drawing, on which  
30

FIG. 1 is a schematic front elevational view of an attachment member of an attachment system according to the invention fastened to the front side of the phone casing;

35 FIG. 2 is a schematic cross sectional view of attachment member according to the invention disposed on the casing at the location of the loud speaker openings;

FIG. 3 is a similar view as FIG. 2 of a second embodiment of the invention; and

FIG. 4 is a similar view as FIG. 2 of a third embodiment of the invention.

FIG. 1 shows a phone 10, to the casing 12 of which an attachment member 14 according to the invention is fastened. The attachment member is disposed on the casing 12 at the location of the sound openings 16 of the loud speaker. The attachment member 14 is rim-shaped and positioned on the casing 12 in the way that the openings 16 are in the centre of the attachment member. The attachment member thus does not essentially cover the openings. The inner diameter  $H$  of the attachment member is typically somewhat larger than the mean diameter  $h$  of the area of the casing covered by the openings. Typically  $H$  is in the order of 1.2 to 1.5  $h$ . The size of the inner diameter, and sometimes also the shape, of the part of the attachment member which is against the casing naturally depend essentially on the area formed by the loud speaker openings. The diameter of the area provided with openings is typically about 5 to 7 mm.

FIG. 2 shows a cross section of the phone casing 12 taken across the openings 16. The attachment member 14 which is shown in an axial cross section comprises a cylindrical base part 18 which is fastened to the casing 12 at its first end 20. Locking members 24 by means of which the attachment member 14 is locked to the holder (not shown) are disposed on the second end 22 of the base part 18.

In the embodiment shown in FIG. 2 the locking member 24 is an annular member, the inner diameter  $H$  of which is of the same size as the inner diameter of the base part 18. The outer diameter  $H_2$  is considerably larger than the outer diameter of the cylindrical base part. The outer surface 26 of the annular part which is to be put against the ear is

convex. The size k of the annular part 24 is preferably such as to fit into the outer ear in front of the ear channel. The outer dimension of the annular part is typically about 8 to 15 mm, most typically about 10 to 13 mm. The total height of the cylindrical base part 18 and the annular part 24 is typically about 5 to 10 mm, most typically about 6 to 8 mm. The dimensions can naturally vary depending on the various types of phones.

10 When the locking member 14 is put against the ear, the parts 18 and 24 prevent noise from reaching the ear and the inner channel 28 of the locking member leads the sound from the loud speaker openings 16 to the ear.

15 FIG. 3 shows an attachment member 14 of another type, which is mainly shaped as a truncated cone. The end 30 having the smaller diameter is fastened by means of a flange 32 to the casing 12 of the phone. The end 34 of the cone having the larger diameter protrudes from the casing and the  
20 protruding surface is in this case flat but could also be convex or of some other shape fitting into the ear.

FIG. 4 shows a third attachment member 14, which is formed of a first cylindrical base part 18 and a second  
25 cylindrical part 36 having an inner diameter of the same size as the first part but a larger outer diameter and disposed on the protruding end thereof. The base part 18 is fastened to the phone casing 12 by means of a flange 32. The loud speaker openings are positioned at the inner  
30 channel 28.

The attachment system according to the invention provides thus with simple means an earphone-like construction at the loud speaker openings, which prevents noise and assists in  
35 carrying sounds from the phone to the ear. In the arrangement according to the invention no parts protruding from the casing of the phone are needed, besides the attachment member. It is thus according to the invention

possible to a great extent to utilize parts already existing in the casing.

Other known attachment systems can be modified according to  
5 the invention in order to improve the audibility.

The invention can be modified in many ways and it is not restricted to the embodiments described above. The annular and cylindrical members do not have to be exactly annular  
10 or cylindrical, but can be of angular or irregular shape and be composed of different parts to form a rim around the loud speaker openings of the phone.

A member like the attachment member can naturally be used  
15 in front of the loud speaker openings for improving the audibility even if the member would not constitute a part of any attachment system.



Claims

1. An attachment system for a mobile phone or the like portable communication means for temporarily attaching it to a belt, the dashboard of a car or the like supporting surface, the attachment system comprising
- an attachment member fastened to the casing of the portable communication means, and
  - a holder on the supporting surface to which said attachment member can be locked,
- characterized** in that
- the attachment member comprises a member substantially forming a rim and fastened to the casing of the communication means at the location of the loud speaker arranged there in the way that it surrounds the openings of the loudspeaker.
2. An attachment system according to claim 1, **characterized** in that the member forming a rim comprises
- a cylindrical part, the first end of which is fastened to the casing of the communication means and the inner diameter of which is larger than the diameter of the area provided with openings formed by the openings of the loud speaker on the surface of the casing, and
  - an actual annular locking member formed at the rim of the second end of the cylindrical part, by means of which the attaching member can be locked to the holder.
3. An attachment system according to claim 2, **characterized** in that
- the inner diameter of the annular locking member is substantially of the same size as the inner diameter of the cylindrical part, and
  - the outer diameter of the annular locking member is larger than the outer diameter of the cylindrical part.

4. An attachment system according to claim 3, characterized in that the annular locking member forms a substantially convex surface against the ear.

5

5. An attachment system according to claim 1, characterized in that the member forming a rim comprises a part shaped as a truncated cone

- 10 - having an axial centre hole, the inner diameter of which is larger than the diameter of the area provided with openings formed by the openings of the loud speaker on the surface of the casing, and
- which is fastened to the casing of the communication
- 15 means at its narrow end.

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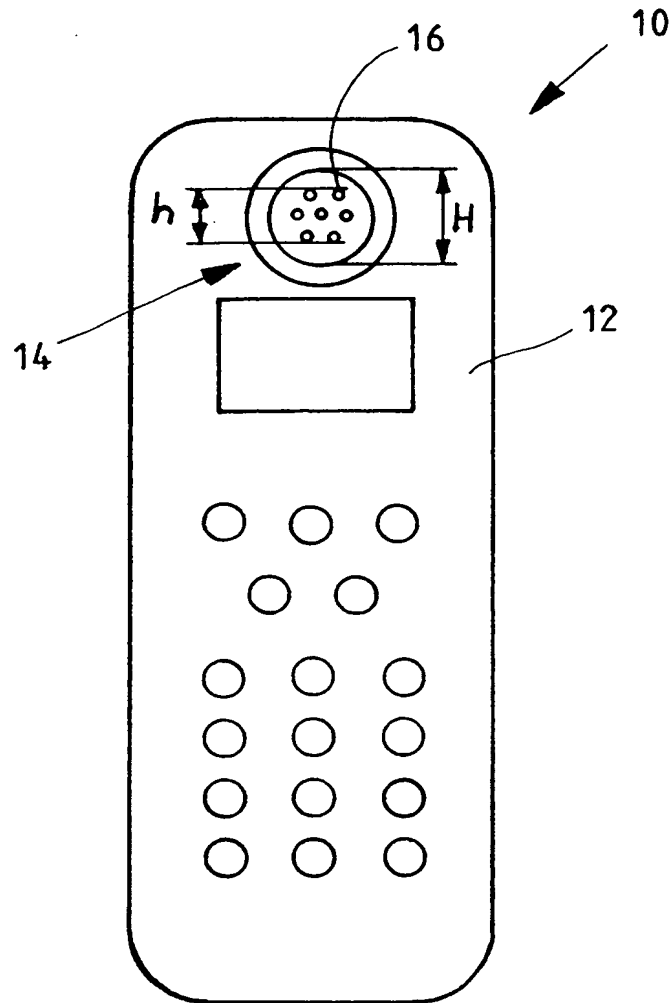
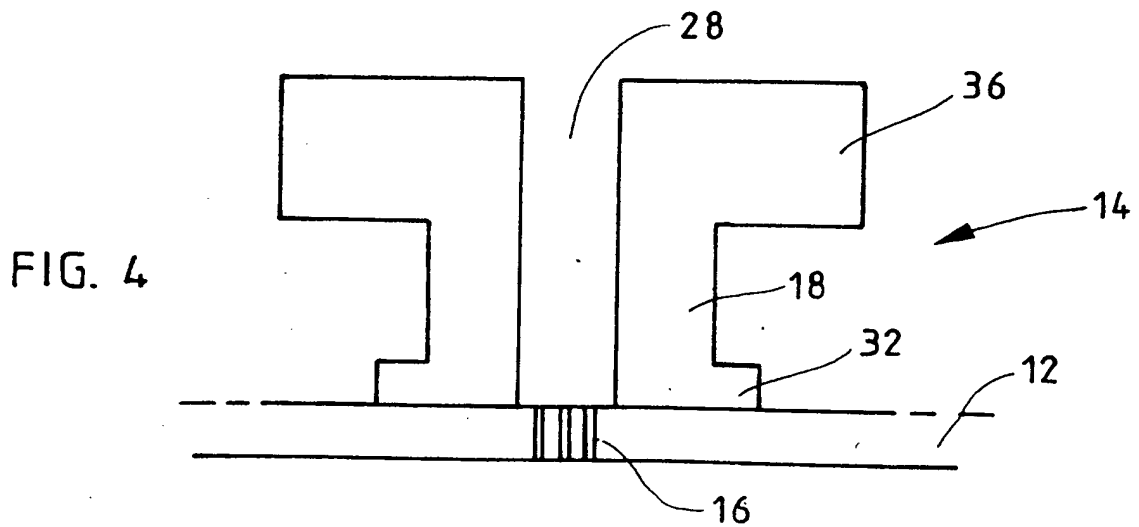
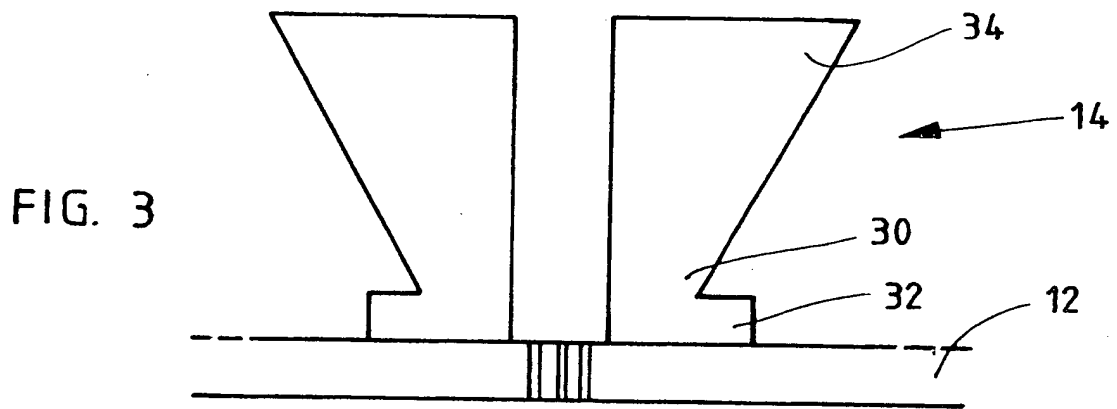
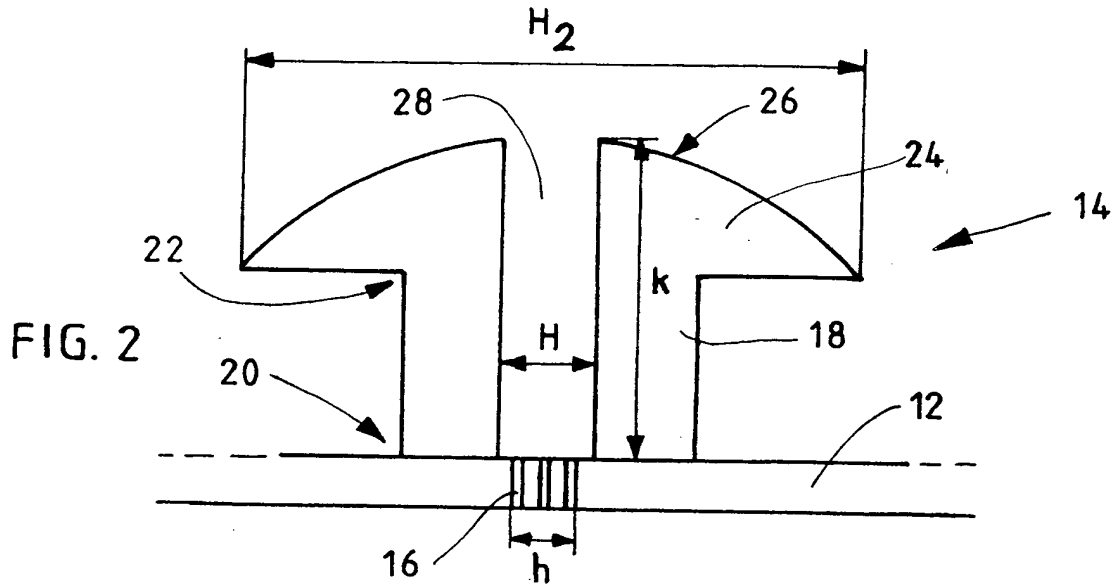


FIG. 1

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 97/00825

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04M 1/04

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9312604 A1 (BAUR, ALBERT), 24 June 1993 (24.06.93), page 9, line 6 - page 10, line 10, figures 1-2	1-2
A	page 9, line 6 - page 10, line 10 --	3-5
X	DE 4344529 A1 (BLAUPUNKT-WERKE GMBH), 29 June 1995 (29.06.95), column 2, line 37 - column 3, line 35, figures 1-5, abstract	1-2
A	column 2, line 37 - column 3, line 35, figures 1-5, abstract --	3-5

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## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

29/04/98

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